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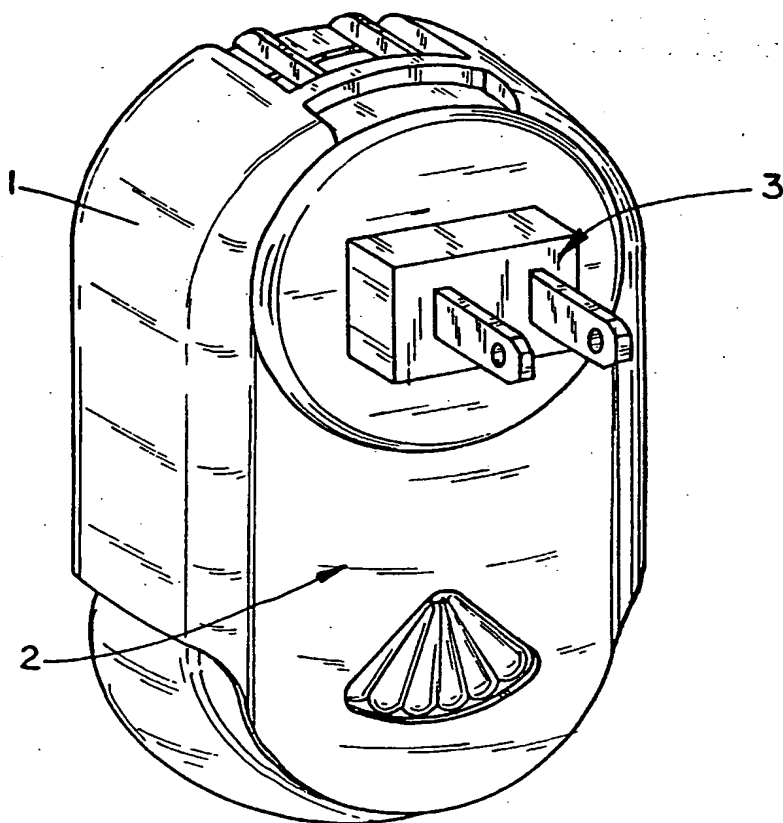
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(54) Title: ACTIVE DISPENSER WITH OFFSET ELECTRICAL PLUG



(57) Abstract: A dispenser of active materials, such as an air freshener or insecticides, comprises an "offset" adapter for plugging into a vertically oriented duplex wall outlet, whereby the effective position of the dispenser's electrical plug is lowered sufficiently so as to fully expose and make available the lower receptacle when plugged into the upper receptable. Further, the dispenser blocks and prevents the use of the upper receptable when plugged into the lower receptable. In this manner, the consumer is prevented from plugging another appliance or device into a receptable that may subject it to contact by vapor being dispensed by the dispenser.

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## ACTIVES DISPENSER WITH OFFSET ELECTRICAL PLUG

BACKGROUND OF THE INVENTION

## Technical Field

The present invention relates generally to dispensers of vaporizable materials. More specifically, the invention relates to an improvement in devices for dispensing a fragrance or air freshener, or other material, in the form of a vapor for air freshening, insect control, or other purpose, in an enclosed environment. The improvement disclosed herein relates to an attachment for an electrical plug-in air freshener device or insect control system, specifically of the type which utilizes an electrical heater to warm an active ingredient for dispensing. This improvement is specifically directed to plug-in units wherein the electrical plug and heater are located at the top of the assembly, a most common form of electrical air freshener dispenser.

## Background Art

The need for effectively combating airborne malodors in homes and enclosed public buildings, by odor masking or destruction, or alternatively by creation of a pleasing or acceptable odor, such as a perfume, to overpower the malodor, is well established, as is the dispensing of insect control materials for killing or deterring insects. Various kinds of vapor-dispensing devices have been employed for these purposes. The most common of such devices is the aerosol container which propels minute droplets of an air freshener composition into the air. Another common type of dispensing device is a dish containing or supporting a body of gelatinous matter which, as it dries and shrinks, releases a vaporized composition into the atmosphere. Other products such as deodorant blocks are also used for dispensing air-treating vapors into the atmosphere by evaporation. Another group of vapor-dispensing devices utilizes a carrier material, such as paperboard impregnated or coated with a vaporizable composition.

A number of recent developments include a liquid air-treating composition in an enclosure, all or part of which is formed of a polymeric film, through which the air-

treating composition can migrate to be released as a vapor, at an outer surface. The use of this type of permeable polymeric membrane controls the dispensing of air-treating vapors, and tends to eliminate great variations in rate of dispensing over the life of the product.

Wicking devices are also well known for dispensing volatile liquids into the atmosphere, such as fragrance, deodorant, disinfectant, or insecticide active agents. A typical wicking device utilizes a combination of a wick and an emanating region to dispense a volatile liquid from a liquid reservoir. Typical wicking devices are described in U. S. Patent Numbers 2,802,695; 2,804,291; 3,550,853; 4,286,754; 4,413,779; 4,913,350; and 5,000,383; all of which are incorporated herein by reference.

Of special interest with respect to the present invention are wicking dispenser devices in which the wicking action is promoted by a heat source. This type of wicking device is described, for example, in U. S. Patent Numbers 1,994,932; 2,597,195; 3,431,393; 4,020,321; 4,968,487; 5,038,394; and 5,290,546; all of which are incorporated herein by reference.

A variety of dispensers of the electrical plug-in type are known in the prior art. One example of such a dispenser is taught by U. S. Patent 5,038,394, of Hasegawa et al. This reference teaches a cordless thermal vaporizer of the liquid type wherein the body of the vaporizer has a heater for heating a wick for drawing up a chemical solution from a bottle, and a socket disposed under the heater and removably fittable in the form of a cap to the bottle for attachment thereto. The body is reduced in weight and thereby made attachable to an electric outlet with stability. The solution bottle can be attached directly to the socket of the body and is easy to replace. Essentially, the patent relates to a thermal vaporizer in which an electric wick warmer is near the top of the assembly, with a bottle containing the vaporizable chemicals suspended below. The reference, in addition, teaches that the plug, located on the back of the vaporizer body, may be rotated through a range of from 0 to 90 degrees to make the arrangement of the plug blades selectively changeable to either a vertical or horizontal orientation, so as to make the vaporizer suitable for use in either vertically or horizontally oriented electrical outlets.

Another example, the Glucksman et al reference, U. S. Patent No. 4,731,520, teaches an aroma dispenser apparatus comprising a replaceable and expendable cartridge containing an aroma producing liquid, and a diffusion housing comprising a heater assembly and blades for coupling the heater assembly to an electrical outlet. In this patent, the electrical plug is shown in the figures as being located in the lower portion of the dispenser, a heater assembly in the central portion, and an aroma block in the upper portion comprising a block of liquid absorbing material, impregnated with the liquid to be vaporized. In use, the dispenser is plugged into an outlet, the heater warms air, which rises to pass over the aroma block, causing the absorbed liquid to vaporize, and to exit the top of the device. Although not discussed, the figures also illustrate a centrally located mounting bolt for attaching the device directly to the electric outlet, i.e. as a replacement for the normal outlet face plate conventionally in use on electrical outlets. Thus, this device involves removal of the outlet face plate for installation and use, and is not suited for simply plugging into one outlet of a vertically disposed outlet pair.

U. S. Patent No. 5,647,053 of Schroeder et al teaches a vapor dispensing device comprising an electric wick warming block in conjunction with a container of liquid to be dispensed, in which the electric plug is rotatable about an axis parallel to the plug pins. This type of dispenser is exemplary of those to which the present invention is applicable.

Thus, it is well known to provide electrical heating devices for dispensing such materials as air fresheners and insect control materials. Such devices typically comprise a reservoir of volatile liquid to be dispensed, an electric heater to warm the volatile material to cause it to vaporize more readily, and an electrical plug to plug the device into an electrical outlet for power. However, it is also well known that if such devices are plugged into the lower receptacle of a vertically oriented duplex outlet, the consumer may choose to employ the use of the upper receptacle for another plug-in apparatus, such as a night light or an electrical cord for an appliance. Such apparatus may therefore be exposed to the potential accumulation of condensation of vapors or fumes from the electrically heated vaporizing unit located below it. Certain apparatus, such as night-lights, are often made with low

cost, easy to manufacture polymeric materials such as polystyrene, for example. These polymeric materials, while meeting the requirements for housing live electrical components, generally exhibit poor chemical resistance properties. Furthermore, some fragrance oils and other liquid compositions employed for use with electrically heated vaporizing units may contain elements which can cause plasticization of the polymeric materials often used in these other apparatus. Plasticization of the polymeric enclosure of these other apparatus could result in the exposure or reduced spacing of live electrical components, thereby creating a risk of shock or fire for the consumer.

Accordingly, the present invention is intended as a means to prevent the consumer from utilizing the upper receptacle when the dispenser is plugged into the lower receptacle of a vertically oriented duplex outlet. The present invention, however, is not limited to liquid dispensing media only, but may be applied to dispensers which utilize gels, solids, or impregnated solid sources of material to be dispensed, wherein said sources of material are heated electrically to increase or control their rate of dispensing, as well as those dispensing devices which employ heated wicking means for dispensing of a vaporizable liquid. A further aspect of the present invention is the repositioning of the electrical plug of the warmer unit sufficiently low enough on the body of the dispenser that when the dispenser is plugged into the upper receptacle of a vertically oriented duplex outlet, such as commonly used for North American electrical outlets, the lower receptacle is completely exposed and usable for insertion of a conventional plug, such as for an appliance or other apparatus.

In accordance with the present invention, it is desired that an electrical plug-in dispenser having a liquid reservoir be fashioned so as to prevent other items from being plugged in directly above it, thus preventing the consumer from placing such items in a position of possible danger. It is also considered desirable that the warming unit of the present invention incorporate a rotatable electrical plug, so that the dispenser may be used in a horizontally oriented electrical outlet, and still keep



the warming unit and reservoir in an upright position. In this orientation of electrical outlet, other electrical devices could not be placed directly above the dispenser and would not pose a potential safety threat.

Thus, while it may be seen that a need exists for dispensers suitable for direct insertion into a wall outlet, to date none of the available dispensers have addressed the problems addressed by the present invention.

### SUMMARY OF THE INVENTION

In one aspect, the invention comprises a means to modify existing plug-in dispensers by providing a readily attachable adapter which prevents use of the dispenser in an inappropriate manner.

In another form, the invention comprises a new design for a plug-in dispenser, wherein the electrical plug is located in such a manner as to overcome the above cited problems of the prior art.

And, in still another form, the invention comprises an adapter suited for attachment to a conventional plug-in dispenser to offset the electrical plug to the extent necessary to prevent the unit, when plugged in, from permitting the use of the receptacle above the dispensing unit. Further, said adapter may be configured so as to permit the use of the dispensing unit in the upper receptacle of a vertically oriented electrical outlet without blocking the use of the lower receptacle for another appliance plug or apparatus.

In a preferred embodiment of the invention, a modification to the housing of the electrically heated vaporizing unit permits attachment thereto of an adapter with means to lower or offset the plug by a distance of about 1¾ inches, or a suitable distance such that when the apparatus is placed in the upper receptacle of a vertically oriented electrical outlet, the bottom of the vaporizing unit will remain sufficiently above the lower receptacle so as to fully expose the lower receptacle, thus permitting its use. Simultaneously, if the apparatus is placed in the lower receptacle of a vertically oriented duplex electrical outlet, the dispensing apparatus

will prevent the use of the upper receptacle. If the adapter is provided with a rotatable electrical plug, as taught herein, the electrically heated plug-in dispenser may be used in either receptacle of a horizontally oriented duplex outlet without loss of accessibility to the other receptacle.

The objects of the present invention therefore include providing an adapter for a plug-in, electrically heated vaporizing dispenser, whereby the dispenser may be used in the upper receptacle of a vertically disposed outlet without inhibiting use of the lower receptacle. A further object of the invention is to provide an electrically heated plug-in vaporizing dispenser which, when used in the upper receptacle, will not preclude use of the bottom receptacle, but when used in the lower receptacle will prevent use of the upper receptacle.

Still another object of the invention is to prevent the inadvertent deterioration or damage of electrical plugs or apparatus by preventing the use of such plugs or apparatus in a position subject to contact with volatile material being dispensed by a plug-in dispenser of such volatile materials.

Another object of the present invention is to provide a means by which an electrically heated plug-in vaporizing dispenser may be properly oriented for use in either a vertically disposed electrical outlet, such as are commonly employed in North America, or for use in horizontally disposed electrical outlets, which are common elsewhere in the world, and are becoming more commonly employed in North America. This object is achieved by the use of a plug which may rotate through 90 degrees, so as to maintain vertical orientation of the plug-in dispenser and liquid reservoir regardless of the orientation of the electrical outlet into which it is plugged.

One or more objects of the present invention are accomplished by the provision of an electrically heated plug-in dispenser of active materials which is adapted for engagement and support by an electrical outlet, wherein:

said dispenser comprises:

- (a) a liquid reservoir chamber of volatile active material, having means for providing release of said volatile active material to the atmosphere;

- (b) an electrical heating element affixed within a hollow body, said hollow body configured so as to support and position said electrical heating element relative to said liquid reservoir chamber; and
- (c) an electrical plug element in electrical contact with said heating element, said plug element having at least two metal blades which extend rearwardly from the hollow body for engagement with a receptacle of an electrical outlet for conducting an electrical current to said heating element, whereby volatilization of active materials into the atmosphere from said liquid reservoir chamber is enhanced by heating; wherein said electrical plug element is offset from said heating element a sufficient distance so as to fully expose the lower receptacle of a vertically oriented electrical outlet when said electrical plug element is plugged into the upper receptacle thereof.

In a dispenser made in accordance with the present invention, said electrical plug element may optionally be rotatable through 90 degrees to provide for insertion of said blades into electrical outlets which are oriented either vertically or horizontally.

One or more objects of the present invention are further accomplished by modifying the body of an electrically heated plug-in dispenser of active materials to accept the attachment thereto of an "offsetting" electrical adapter which is adapted for engagement and support by an electrical outlet, thereby providing a dispenser of active materials which is a cooperative assembly of components comprising:

a plug-in dispenser comprising:

- (a) a liquid reservoir chamber of volatile active material, having means for providing release of said volatile active material to the atmosphere ;
- (b) an electrical heating element affixed within a hollow body, said hollow body configured so as to support and position said electrical heating element relative to said liquid reservoir chamber;
- (c) a dispenser plug element in electrical contact with said heating element, said dispenser plug element having at least two metal blades which extend rearwardly from the hollow body for engagement with a

receptacle for said dispenser plug element, for conducting an electrical current from said receptacle to said heating element, whereby volatilization of active materials into the atmosphere is enhanced by heating; and

an "offset" adapter comprising an adapter body having:

- (d) a receptacle in the forward side thereof for said dispenser plug element;
- (e) an electrical conductor extending downwardly from said receptacle; and
- (f) an adapter plug element comprising at least two metal blades in contact with said conductor and extending outwardly from the rearward side thereof to engage an external electrical outlet and to conduct an electrical current from said external electrical outlet to said receptacle for said dispenser plug element;

wherein said adapter plug element is offset from said heating element a sufficient distance so as to fully expose the lower receptacle of a vertically oriented external outlet when plugged into the upper receptacle thereof.

As in the previous embodiment of the invention, the metal blades which engage the electrical outlet may be, but need not be, rotatable.

Accordingly, a further goal of the present invention is achieved by providing an adapter for attachment to a dispenser of active materials, wherein said dispenser comprises a reservoir of active materials, an electrical heating element, and an electrical plug, and said adapter comprises:

- (a) a receptacle for the electrical plug of said dispenser, said receptacle being located in the upper portion of said adapter, and facing toward said electrical plug of said dispenser;
- (b) an adapter plug for insertion of said adapter into a conventional receptacle of an electrical wall outlet, said adapter plug being located in the lower portion of said adapter and facing in the direction opposite the direction faced by said receptacle for the electrical plug of said dispenser; and

(c) electrical circuitry providing a path for the flow of electricity between said adapter plug and said receptacle for the electrical plug of said dispenser, whereby electricity may be conducted between said wall outlet and said electrical plug of said dispenser; wherein said adapter plug is offset from said heating element a sufficient distance so as to fully expose the lower receptacle of a vertically oriented wall outlet when said adapter plug is plugged into the upper receptacle thereof.

Thus it may be seen that an element of the present invention may comprise a means to adapt a dispenser of active materials to offset the electrical plug of said dispenser the approximate distance between the centerlines of the plug receptacles of a conventional electrical wall outlet, or 1.75 inches. Such an adapter may take the form of a "bridge" adapter, or may comprise a new back cover to enclose the back of said dispenser.

Further, such an adapter may be part of the dispenser sold to the consumer, or may be provided as a separate element to be used by the consumer to adapt separately purchased dispenser units, it being an object of the invention to provide the consumer means to prevent the active element being dispensed from causing damage to electrical elements inserted into an electrical receptacle above that into which the dispenser is inserted.

These and still other objects and advantages of the present invention will be apparent from the description which follows. The following description is merely of the preferred embodiments, and thus the claims should be looked to in order to understand the full scope of the invention.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a simplified perspective view of the rear portion of a typical conventional plug-in actives dispenser, showing the relative location of the various components thereof.

Figures 2 through 4 are simplified exploded perspective views of various forms of dispenser and adapter assemblies in accordance with the present

invention.

Figure 5 is an exploded perspective view of an adapter suitable for use in the present invention.

Figure 6 is an exploded perspective view of a dispenser modification of the present invention, having a rotatable offset plug.

Figure 7 is a perspective view of the assembled dispenser of Figure 6.

Figures 8 and 9 are exploded perspective views of alternative dispensers of the present invention.

#### DETAILED DESCRIPTION OF THE INVENTION

The present invention provides an improvement, and a safety enhancement, over conventional electrically heated dispensers of air fresheners or other volatile materials. It is to be understood that while the present disclosure is written in terms of air fresheners, the invention is also applicable to electrically heated dispensers of various other volatile materials, such as insect control devices. The materials most commonly dispersed by such dispensers include volatile substances selected from the group consisting of fragrances, air fresheners, deodorizers, odor eliminators, malodor counteractants, insecticides, insect repellants, medicinal substances, disinfectants, sanitizers, mood enhancers, aroma therapy compositions, mixtures thereof, and other volatile materials easily dispersed by evaporation over an extended period of time, particularly when subjected to heat in an electrically warmed dispenser. Such dispensing means, frequently utilizing a wick for liquid dispersibles, are well known in the prior art. Other dispensing products, such as impregnated plastic or ceramic substrates, or deodorant blocks, are also used to disperse air-treating vapors into the atmosphere by evaporation. Still other forms of such passive dispensers include liquid or gel cartridges which contain a dispersible substance which is time releasable through a porous covering of the cartridge, such as disclosed in U. S. Patent 5,788,155 of Martin et al, the teachings of which are incorporated herein by reference. The dispensers of the present invention are those which are conventionally referred to as passive, and include those which require no action by the consumer, other than plugging into an electrical outlet, but dispense a

dispersible by evaporation, sublimation, or the like, under the influence of an elevated temperature over a period of time, at a relatively low dispersal rate when compared to the dispersal rate of an active dispenser such as an aerosol or pump activated spray.

Many such dispensers are known, which may be free-standing, with an electrical cord for connection to a source of electricity to heat a resistance heating element in close proximity to a source of vaporizable material (hereinafter referred to as an active) contained within the dispenser, so as to heat the active and cause its more efficient vaporization. Likewise, many dispensers of this nature are known which are designed to be plugged directly into a wall outlet, and are structured with a plug and support means built right into the dispenser, so that when the plug is inserted into a wall receptacle, the dispenser is supported in place by the plug. Exemplary of such plug-in dispensers are those marketed under the tradename GLADE®, by S. C. Johnson and Son, Inc., of Racine, Wisconsin. The present invention is specifically considered to be an improvement upon such dispensers.

It is known that when a plug-in dispenser is inserted into the lower receptacle of a vertically oriented duplex wall outlet, the upper receptacle may be available for use with another electrical device, such as the plug of an electrical appliance, or another plug-in device such as a night-light, dependent upon the size and shape of said plug-in dispenser. Conversely, when a plug-in dispenser is plugged into the upper plug of such a vertically oriented wall outlet, the lower outlet is usually blocked from use, due to the fact that most such plug-in dispensers position the electrical plug directly in line with the heater portion of the dispenser. This allows a reservoir of actives to be suspended below the dispenser so as to obtain maximum stability as a result of the lower rear portion of the dispenser or reservoir contacting the external surface of the lower receptacle, and thus limiting the potential pivoting of the dispenser out of the receptacle. Accordingly, this type of plug-in dispenser of active materials frequently prevents usage of the second or lower receptacle of a vertically oriented wall outlet when plugged into the upper receptacle. In those instances where the shape and/or size of the dispenser unit permit the insertion thereof into the lower receptacle of a vertically oriented duplex outlet, thus freeing the upper

receptacle for use, any plug inserted into the upper receptacle is subject to contact by vapors of the active being dispensed. In many such instances, the active may contain a solvent which may condense on the surface of another appliance or device plugged directly into the upper receptacle. This may in turn cause deterioration or degradation of the other device or appliance, and may in time cause short circuits or damage thereto. For example, fragrance oils frequently employed in air fresheners contain solvents or compositions which may cause plasticization of plastics such as styrene, which is often used in the manufacture of night-lights, for example, due to its low cost and ease of manufacture.

The present invention provides a means by which both receptacles of a vertically oriented wall outlet may be used without inconvenient or potentially dangerous consequences. One means is by offsetting the electrical plug of a plug-in dispenser of actives sufficiently that the dispenser may be used in the upper receptacle without inhibiting the use of the lower receptacle. Thus, a key element of the present invention is to assure that the electrical plug of the dispenser is positioned low enough on the rear portion of the dispenser so that when the dispenser is plugged into the upper receptacle of a vertically oriented duplex outlet, the lower receptacle is completely exposed and usable. Further, should the consumer choose to insert the plug-in dispenser of the present invention into the lower receptacle, the upper receptacle will be blocked, thus preventing the consumer from inadvertently creating a safety hazard by plugging a night-light (for example) into the upper receptacle and causing it to be subjected to vapors which might deteriorate or degrade the composition thereof.

Further, when a rotatable plug is utilized in the present invention, the dispensers thereof may be placed in either receptacle of a horizontally oriented outlet, while still maintaining the vertical orientation of the dispenser, and thus preventing leakage from the reservoir containing the active. In such a situation, this dispenser would not be subject to placement of another electrical device or appliance directly above the dispensing device and therefore in the path of volatiles being dispensed thereby.



These improvements are accomplished by providing an offsetting means for the dispenser plug. As previously noted, the conventional plug-in dispenser has the plug located on the rear of the dispenser, generally in the upper portion thereof. Figure 1 shows a perspective view of the rear of an electrically heated dispenser unit, illustrating the typical structure thereof. Shown is an electrically heated dispenser, 1, having an external housing, or cover, 2. Within the housing, but not shown, is a replaceable reservoir for the active material to be dispensed, in the form of an inserted bottle with wicking means, for example, and heating means in close proximity to the active material to more rapidly vaporize said active. Also present, and not shown, are the necessary electrical circuitry or path to conduct electricity from the external heater plug, 3, to the heater itself. The dispenser illustrated is of the type which may be plugged directly into a receptacle in a wall outlet, and which generally bears decorative indicia or patterns on the external surface, particularly the front surface, which faces the consumer when the dispenser is plugged into a wall outlet. This type of dispenser may be inserted into either of the two receptacles of a vertically oriented duplex outlet. When inserted into the upper outlet, it may be seen that the lower portion of the dispenser will prohibit use of the bottom outlet, by virtue of the relatively high position of the plug. Conversely, if the dispenser is inserted into the bottom outlet, the upper outlet will be available for insertion of another plug or appliance, which will be exposed to vapors rising from the dispenser, and thus subject to possible damage.

Figure 2 illustrates the use of an adapter in conjunction with a dispenser of active materials such as shown in Figure 1. The adapter, 6, is configured so as to have a receptacle (not shown) positioned on the forward side thereof to accept the metal blades of the heater plug of the dispenser, 4. The heater plug blades are preferably shortened, so as to enable the adapter to be made smaller, thus decreasing the distance by which the dispenser is moved outwardly from the wall outlet by the adapter. Internally, the adapter has electrical circuitry to provide a path for the flow of electricity between the external offset plug, 7, located near the bottom edge of the rear surface of the adapter, and said receptacle for the heater plug. The

internal circuitry may take any appropriate form, such as connecting wire, printed circuitry, printed metal film, conductive blades, etc. Thus, when the dispenser plug is inserted into the adapter, and the adapter inserted into a wall outlet receptacle, a flow of electricity is provided to the heater element within the housing of the dispenser, thus heating the active material and causing it to vaporize. For greater stability, various means may be employed, in addition to the insertion of the heater plug, 4, into the adapter receptacle, to attach the adapter to the dispenser. For example, as shown in Figure 2, a male mounting pin, 8, may be inserted into an appropriately sized hole or receiver, 5, in the housing of the dispenser unit, to hold the adapter in position. Said pin or other supporting means may be designed to be removably fitted to the dispensing unit, or permanently attached thereto. Preferably, the distance between the centerline of the receptacle of the adapter and the centerline of the plug of the adapter is sufficient so as to offset the dispenser and reservoir vertically to a position that fully exposes the lower receptacle of a vertically oriented duplex outlet when the plug of the adapter is inserted into the upper receptacle thereof. Additionally, when the offset plug is placed in the lower receptacle of a vertically oriented duplex outlet, the upper receptacle is blocked by the dispensing unit and will not be available for use.

In Figure 3, an alternative form of adapter is illustrated, having clips as the mounting means, 8, for insertion into appropriately shaped and located openings, 5, in the housing, 2, of the dispensing unit 1. As in Figure 2, the adapter, 6, has internal circuitry between offset plug 7, and the receptacle (not shown) for the metal blades of the dispenser plug, 4.

A variation of the invention is illustrated in Figure 4, wherein an adapter suitable for permanent attachment to the electrical plug of the dispensing unit is illustrated. In addition to the elements present in Figure 3, this embodiment of the invention may have attachment means 9, located on the dispenser, 1, in proximity to the plug, 4. These attachment means may be inserted into receivers, 10, in the adapter, and affixed thereto either temporarily or permanently. For example, the attachment means, 9, may take the form of threaded members which pass through the aligned receivers, 10, and are capped with a complementarily threaded nut or

cap. Conversely, the attachment means may take the form of threaded bolts which are passed through the receivers 10 in the adapter and threaded into complementarily threaded holes in the housing, 2. Alternatively, the attachment means may merely constitute pins which are affixed to the heater plug, and pass into or through the receivers 10, where they are heat staked to create a rivet head type of attachment to prevent their removal from the receivers. Alternative attachment means may of course be utilized, such as gluing, melting to bond, or crimping. The adapter as illustrated comprises a one piece injection molded housing having the necessary receptacle, internal electrical path, and offset plug, with the lower portion thereof, 13, folded upward as a closure, as set forth in Figure 5.

In Figure 5, an injection molded adapter housing is shown in exploded form to illustrate one method for providing an electrical path between the adapter's receptacle for the dispenser plug, and the offset plug. The adapter, 6, comprises an injection molded housing, having a hinge, 12, whereby the lower portion, 13, of said molded housing may be folded upward to form a closure over the internal electrical connection, which may be a printed thick film comprising a conductive ink path, 14, on a suitable flexible non-conductive base, 15. The non-conductive base may be mounted in said housing, 11, by means of appropriate locating means or pins, 16. The printed thick film has die cut, "U" shaped slits, 20, at the ends of the conductive ink path, into which the plug pin bridge, 17, and the shortened heater plug, 4, not shown, are inserted. The blades, 19, of said plugs, when passed through said slits, deform the flexible base and contact the conductive ink path thereupon, thus establishing an electrical connection, as shown. The plug pin bridge is inserted through the lower section of the printed thick film, and held in place in the plug housing by means of pin bridge lock 18, and the lower portion, 13, of said plug housing is folded upward to close over the plug pin bridge and the printed thick film electrical path, and held in position by flexible clips 21. The adapter may then be placed over the blades of the plug of a dispenser, and said blades shall pass through the upper die slits in the printed thick film, contacting the conductive ink path thereupon, and completing the electrical circuit. The injection molded housing may be of any appropriate polymeric material, suitably rated as V-2 or better, for the

direct support of live un-insulated electrical parts, such as polystyrene, polypropylene, polyethylene, or nylon, for example.

Similarly, the conductive ink may be any such ink known to the art with a high electrical conductive rating and low resistance value, such as a silver or gold filled ink, suitable to establish an electrical current. The base film may be any suitable flexible non-conductive film, such as a mylar or polyester film. While this embodiment is illustrated as one alternative for the configuration of a suitable adapter, other embodiments will be apparent to one of skill in the art, and are to be considered within the scope of the present invention. For example, a simple wired connection may be made between the adapter's receptacle for the dispenser plug and the offset plug, thus providing the necessary electrical circuitry.

Figure 6 illustrates a modified dispensing unit, having a simplified back cover attachment. As shown, the dispenser, 1, having housing 2, is modified by the addition of mounting points, 22, for back cover 23. The cover, in turn, has an opening, 24, therein, through which the new rotating plug deck, 25, may fit. The rotating plug, 26, is connected to dispenser plug 4, by means of electrically conductive wires, 27, or other appropriate conductive means.

When assembled, the dispenser and back cover attachment of Figure 6 provide an attractive and simple modified dispenser, 28, as illustrated in Figure 7. As shown, the modified dispenser comprises a housing, 2, a back cover 23, and a rotatable plug deck 25. This dispenser is particularly suitable for placement in a horizontally oriented outlet, since the rotation of the plug 26 permits one to maintain the dispensing unit and actives reservoir contained therein, in an upright orientation. As illustrated, the offset of the rotating plug of the modified dispenser is sufficiently spaced so as to offset the dispenser and reservoir vertically to a position that fully exposes the lower receptacle of a vertically oriented duplex outlet when the unit is plugged into the upper receptacle of a vertically oriented wall outlet.

In Figure 8, another embodiment of the modified dispenser of Figure 7 is shown. Here, modified dispenser housing 29, is provided having an opening, 30, therein for insertion of a heater unit, 31, which is mounted to the face of printed circuit board 32, having electrically conductive path 33 printed thereupon. The

printed conductive path, 33, when the dispenser is assembled, will contact rotating plug deck 25, assuring a conductive path from offset plug 26 to heater 31. The back cover, 23, is provided a hole 24, to fit over the plug deck and a means for permanent attachment of the back cover to the mounting points 22 of the modified dispenser housing 29. In such a modified dispenser, a bottle of liquid active material may be placed in the lower portion of the dispenser, with a wicking material rising therefrom to a position in proximity to the heater unit when it is placed in the opening, 30.

A similar modified dispenser, having a fixed or non-rotating plug, may be provided, as shown in Figure 9. Here, a modified dispenser housing, 29, having mounting points 22, may be attached to a back cover, 23, having non-rotating offset plug 26. The necessary electrical connection between the offset plug, and the heater plug, 4, are not shown, but may take any of the forms previously illustrated, or any other suitable form.

Dispensers in accordance with the present invention have been produced, in the various forms illustrated by the Figures. These dispensers have been used to dispense such actives as insecticides and fragrancings compounds. Such dispensers were suitable for use in either receptacle of a vertically oriented duplex outlet, and permitted use of the lower receptacle for another purpose when the dispensers were plugged into the upper receptacle, but precluded use of the upper receptacle when plugged into the lower receptacle, as desired.

While the present invention has been described with respect to what is at present considered to be the preferred embodiments, it is to be understood that the invention is not to be limited to the disclosed embodiments. To the contrary, the invention is intended to cover various modifications and equivalent arrangements within the spirit and scope of the appended claims. The scope of the following claims is to be accorded the broadest interpretation so as to encompass all such modifications and equivalent formulations and functions.

INDUSTRIAL APPLICABILITY

5 The improvements set forth by the present invention are readily achieved through the use of conventional materials, well known in the art to which the invention pertains, and represent enhancements of readily available commercial products. The materials suitable for use are readily available, and easily shaped or configured for the purpose of the invention by known means. The products formed represent an improvement over those presently available, and increase safety and convenience of usage thereof.

CLAIMS

I claim:

1. An electrically heated plug-in dispenser of active materials, said dispenser comprising:

- (a) a liquid reservoir chamber of volatile active material, having means for providing release of said volatile active material to the atmosphere;
- (b) an electrical heating element affixed within a hollow body, said hollow body configured so as to support and position said electrical heating element relative to said liquid reservoir chamber; and
- (c) an electrical plug element in electrical contact with said heating element, said plug element having at least two metal blades which extend rearwardly from the hollow body for engagement with a receptacle of an electrical outlet for conducting an electrical current to said heating element, whereby volatilization of active materials into the atmosphere from said liquid reservoir chamber is enhanced by heating;

wherein said electrical plug element is offset from said heating element a sufficient distance so as to fully expose the lower receptacle of a vertically oriented electrical outlet when said electrical plug element is plugged into the upper receptacle thereof, and wherein access to the upper receptacle of a vertically oriented electrical outlet is blocked when said electrical plug element is plugged into the lower receptacle thereof.

2. The dispenser of Claim 1, wherein said active material is selected from the group consisting of fragrances, air fresheners, deodorizers, odor eliminators, malodor counteractants, insecticides, insect repellants, medicinal substances, disinfectants, sanitizers, mood enhancers, aroma therapy compositions, and mixtures thereof.

3. The dispenser of Claim 2, wherein said active material is present in a form selected from the group consisting of liquids and gels.

4. The dispenser of Claim 2, further comprising a wicking matrix extending upwardly from said reservoir.

5. The dispenser of Claim 2, wherein said electrical plug element is rotatable.

6. A dispenser of active materials which is an assembly of components comprising:

a plug-in dispenser comprising:

- (a) a liquid reservoir chamber of volatile active material, having means for providing release of said volatile active material to the atmosphere;
- (b) an electrical heating element affixed within a hollow body, said hollow body configured so as to support and position said electrical heating element relative to said liquid reservoir chamber;
- (c) a dispenser plug element in electrical contact with said heating element, said dispenser plug element having at least two metal blades which extend rearwardly from the hollow body for engagement with a receptacle for said dispenser plug element, for conducting an electrical current from said receptacle to said heating element, whereby volatilization of active materials into the atmosphere is enhanced by heating; and

an "offset" adapter comprising an adapter body having:

- (d) a receptacle in the forward side thereof for said dispenser plug element;
- (e) an electrical conductor extending downwardly from said receptacle; and
- (f) an adapter plug element comprising at least two metal blades in contact with said conductor and extending outwardly from the rearward side thereof to engage an external electrical outlet and to conduct an electrical current from said external electrical outlet to said receptacle for said dispenser plug element;



wherein said adapter plug element is offset from said heating element a sufficient distance so as to fully expose the lower receptacle of a vertically oriented outlet when plugged into the upper receptacle thereof and wherein access to the upper receptacle of a vertically oriented electrical outlet is blocked when said electrical plug element is plugged into the lower receptacle thereof.

7. The dispenser of Claim 6, wherein said active material is selected from the group consisting of fragrances, air fresheners, deodorizers, odor eliminators, malodor counteractants, insecticides, insect repellants, medicinal substances, disinfectants, sanitizers, mood enhancers, aroma therapy compositions, and mixtures thereof.
8. The dispenser of Claim 7, wherein said active material is selected from the group consisting of air fresheners, fragrances, deodorants, disinfectants, and insecticide active agents.
9. The dispenser of Claim 7, wherein said active material is present in a form selected from the group consisting of liquids and gels.
10. The dispenser of Claim 7, wherein said active material is a liquid, and said dispenser further comprises a wicking matrix.
11. The dispenser of Claim 10, wherein said adapter plug element is rotatable.
12. An adapter for a dispenser of active materials, said dispenser comprising a reservoir of active materials, an electrical heating element, and an electrical plug, and said adapter comprising:
  - (a) a receptacle for the electrical plug of said dispenser, said receptacle being located in the upper portion of said adapter, and facing toward said electrical plug of said dispenser;

- b) an adapter plug for insertion of said adapter into a conventional receptacle of an electrical wall outlet, said adapter plug being located in the lower portion of said adapter and facing in the direction opposite the direction faced by said receptacle for the electrical plug of said dispenser; and
  - (c) electrical circuitry providing a path for the flow of electricity between said adapter plug and said receptacle for the electrical plug of said dispenser, whereby electricity may be conducted between said wall outlet and said electrical plug of said dispenser;
- wherein said adapter plug is offset from said heating element a sufficient distance so as to fully expose the lower receptacle of a vertically oriented wall outlet when said adapter plug is plugged into the upper receptacle thereof and wherein access to the upper receptacle of a vertically oriented electrical outlet is blocked when said electrical plug element is plugged into the lower receptacle thereof.
13. The adapter of Claim 12, wherein said adapter is a molded housing configured so as to lower the effective plug-in position of said dispenser.
14. The adapter of Claim 12, wherein said adapter plug is rotatable.

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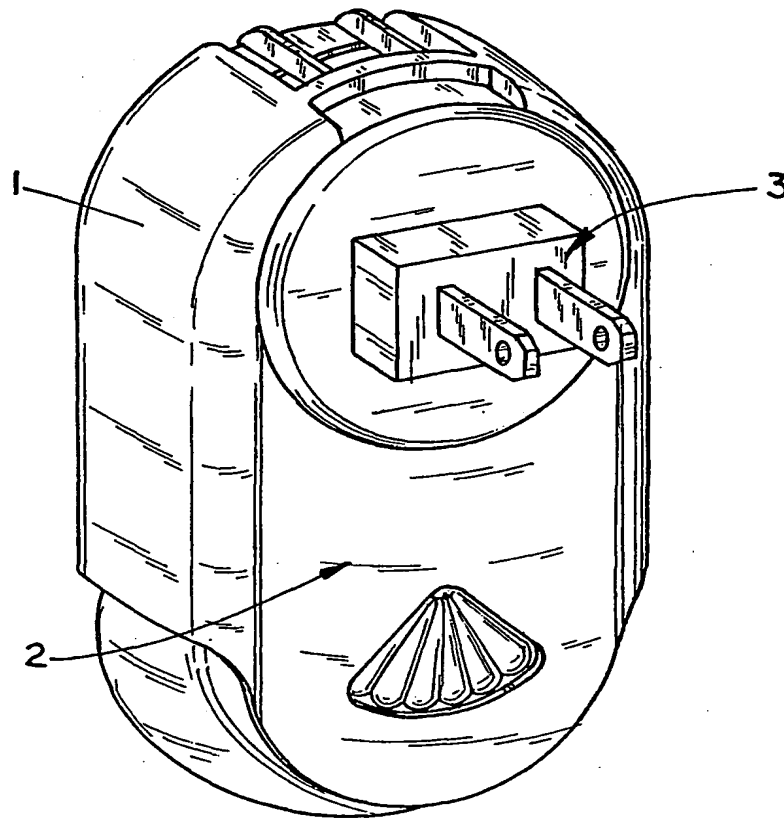
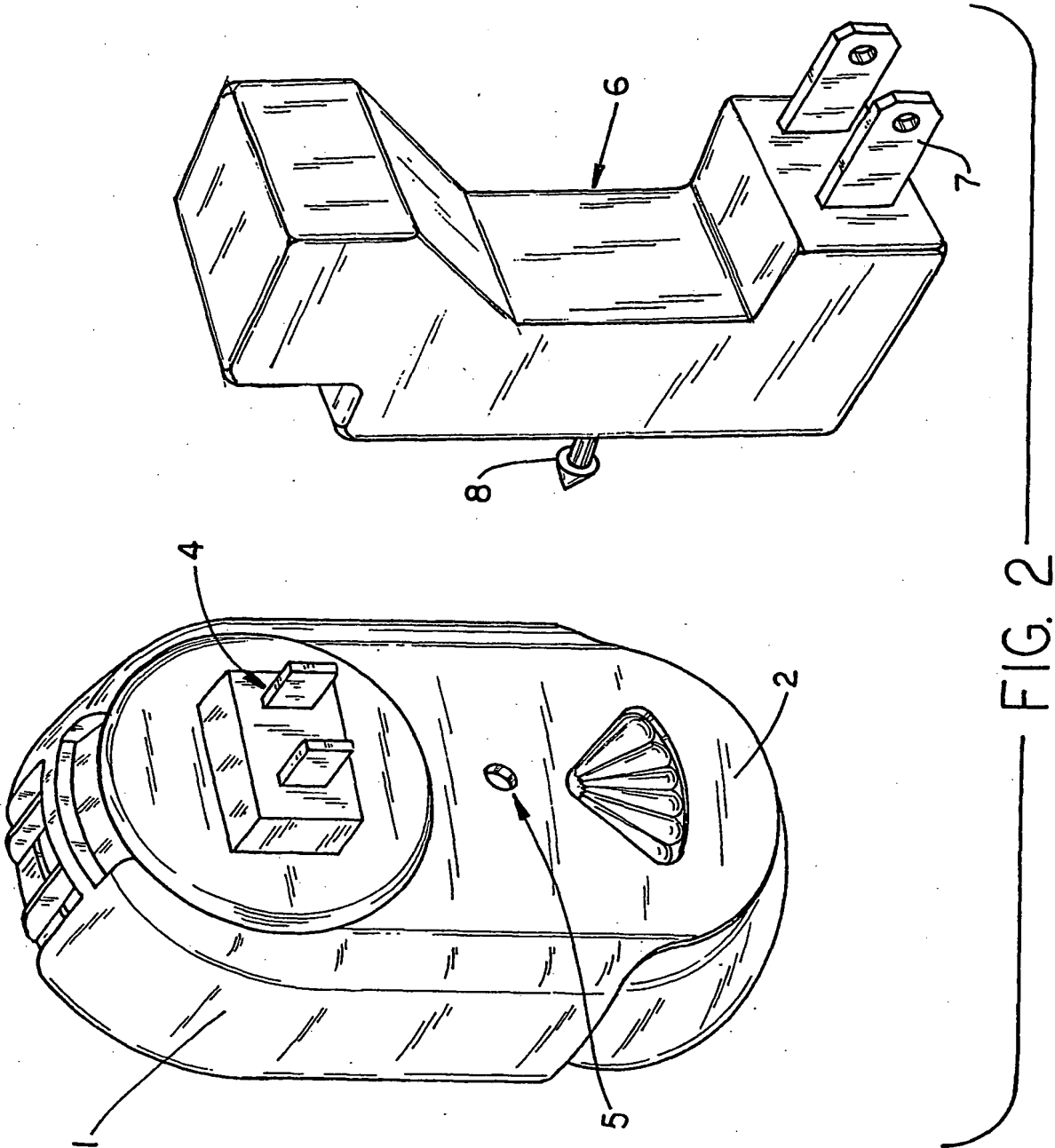


FIG. 1

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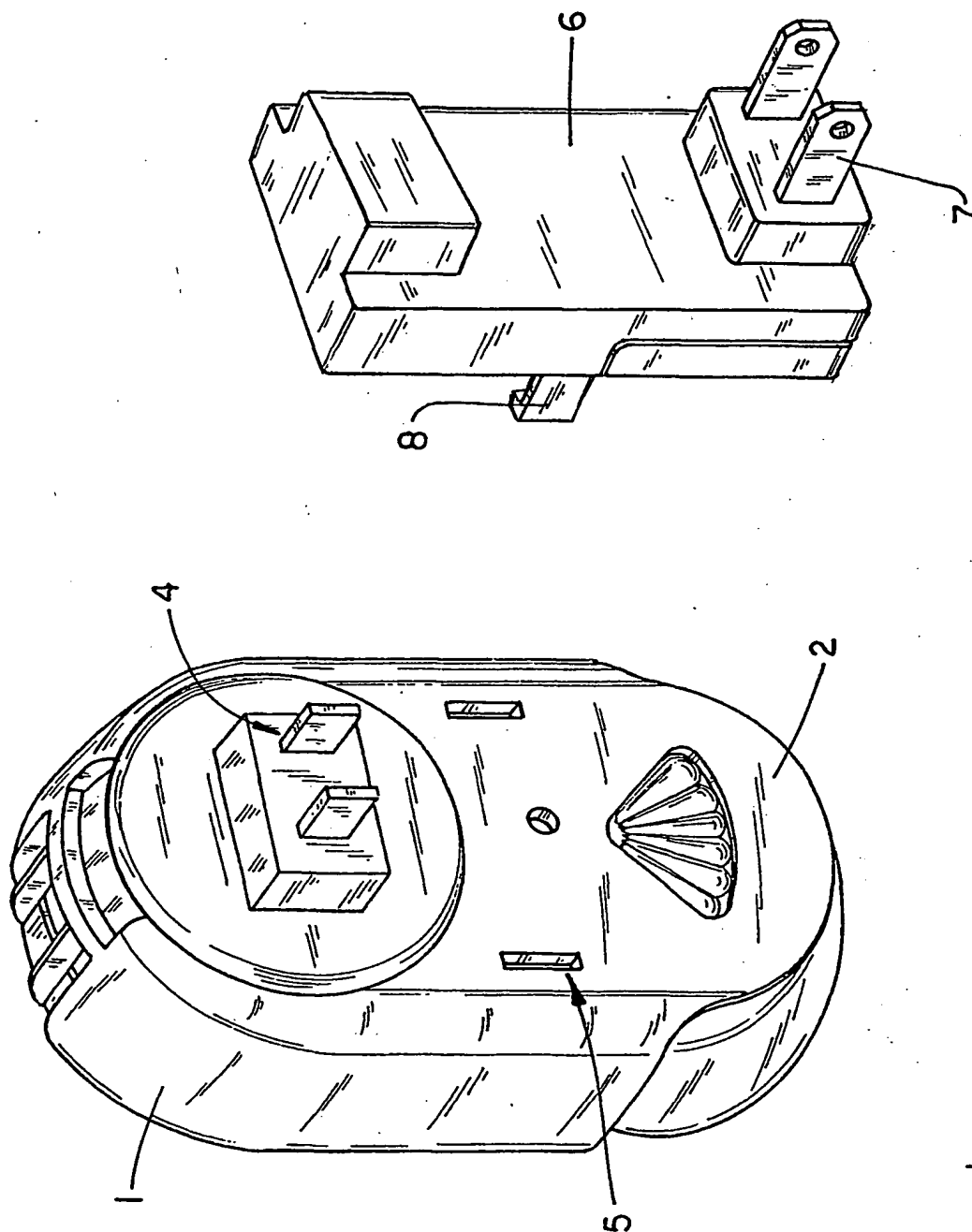


FIG. 3

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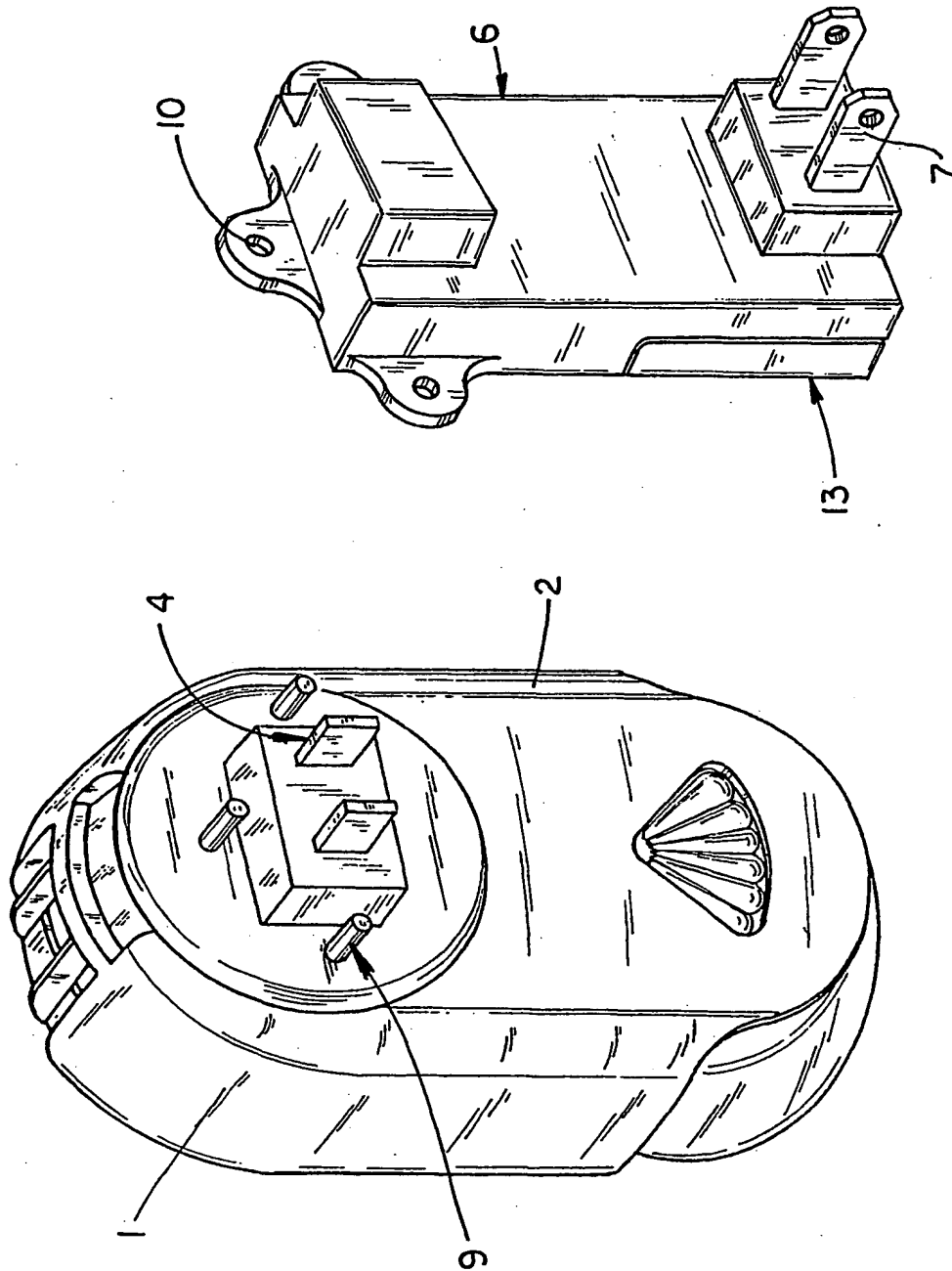
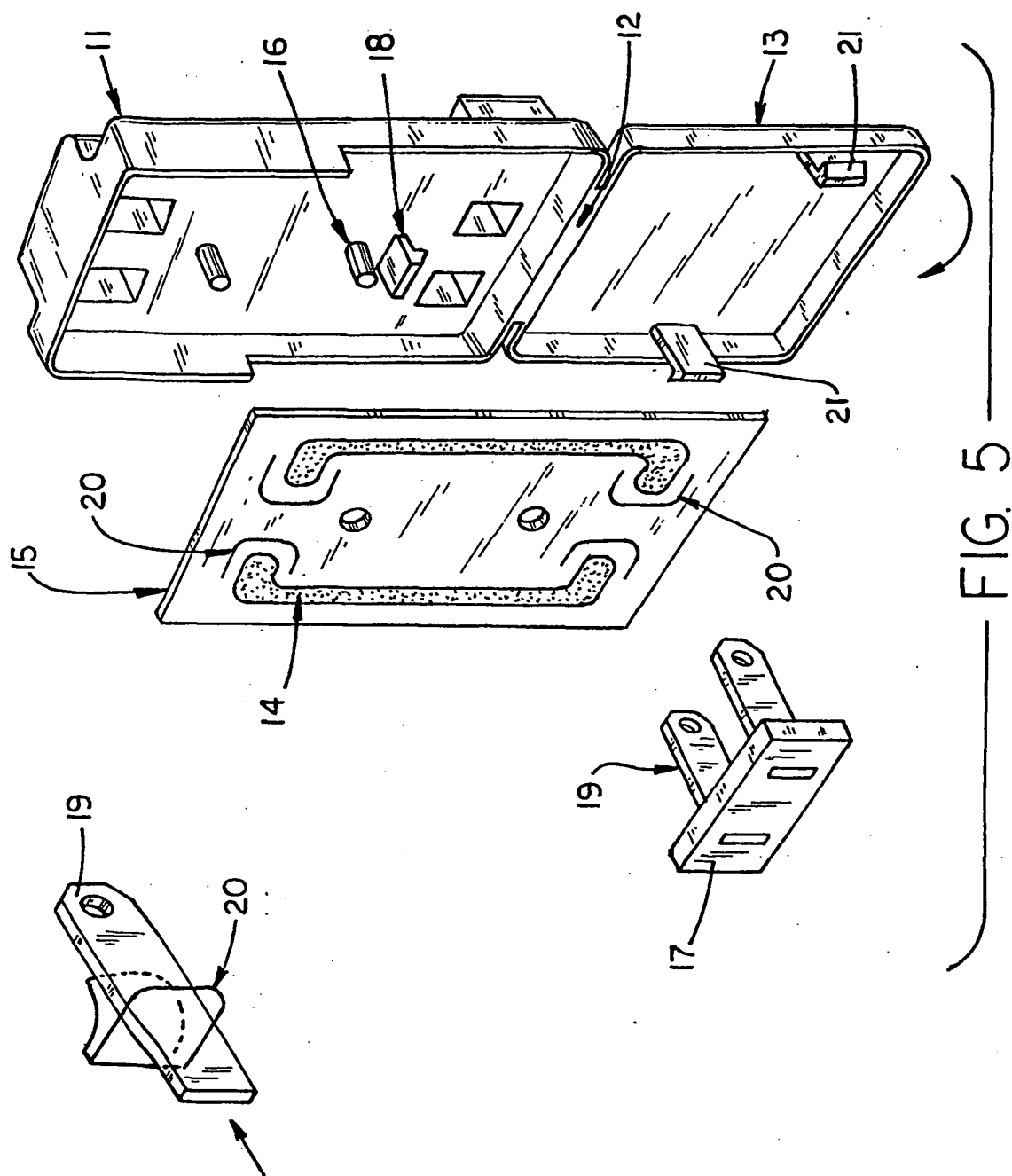


FIG. 4

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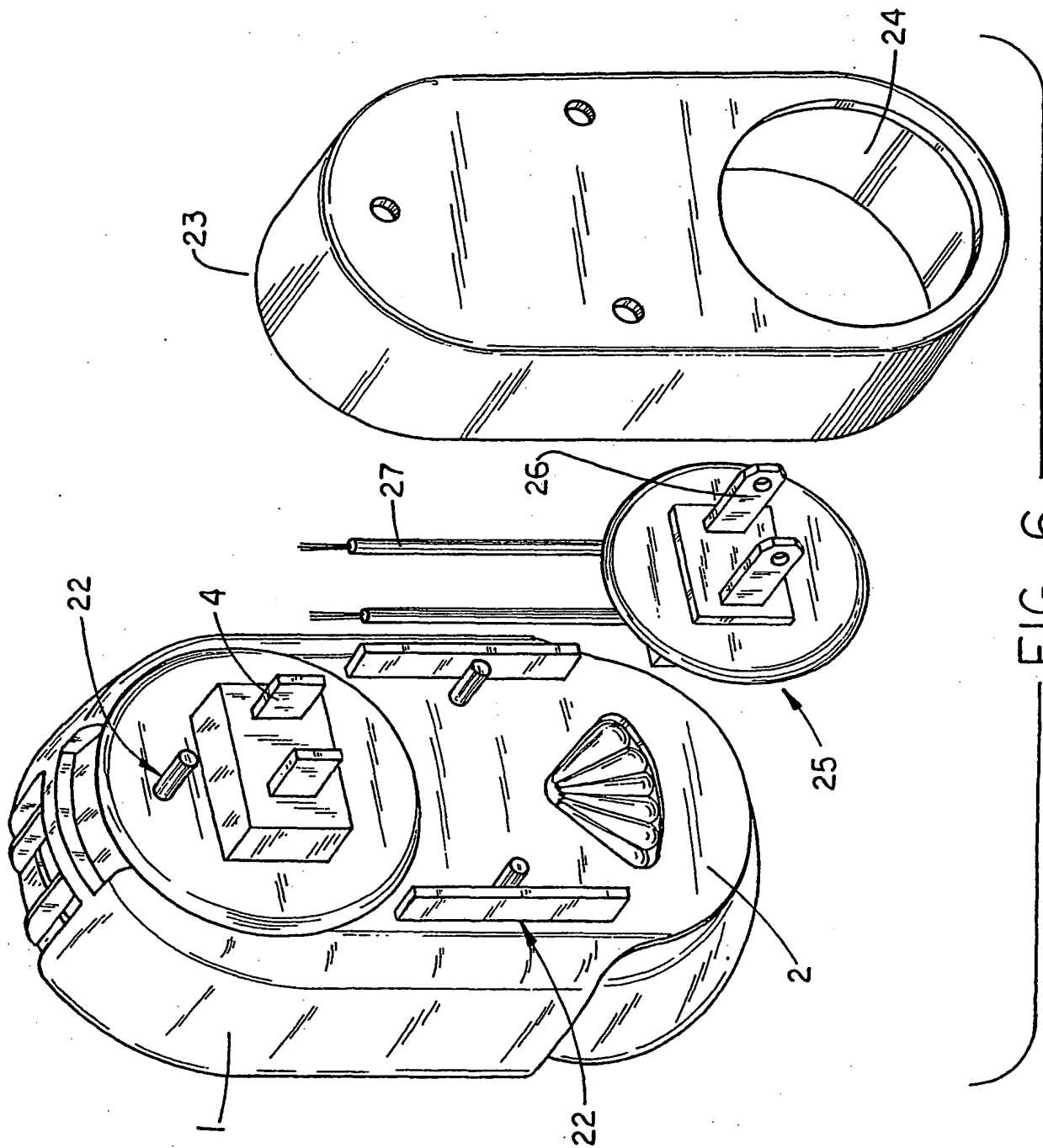


FIG. 6



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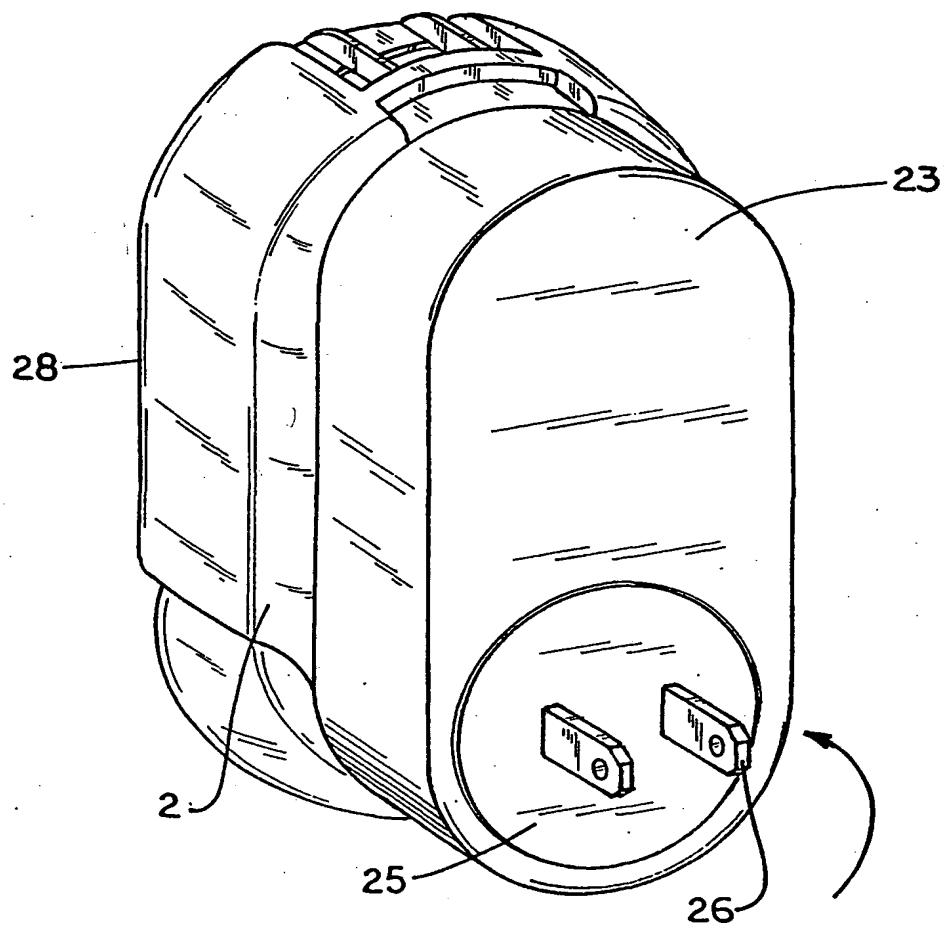


FIG. 7

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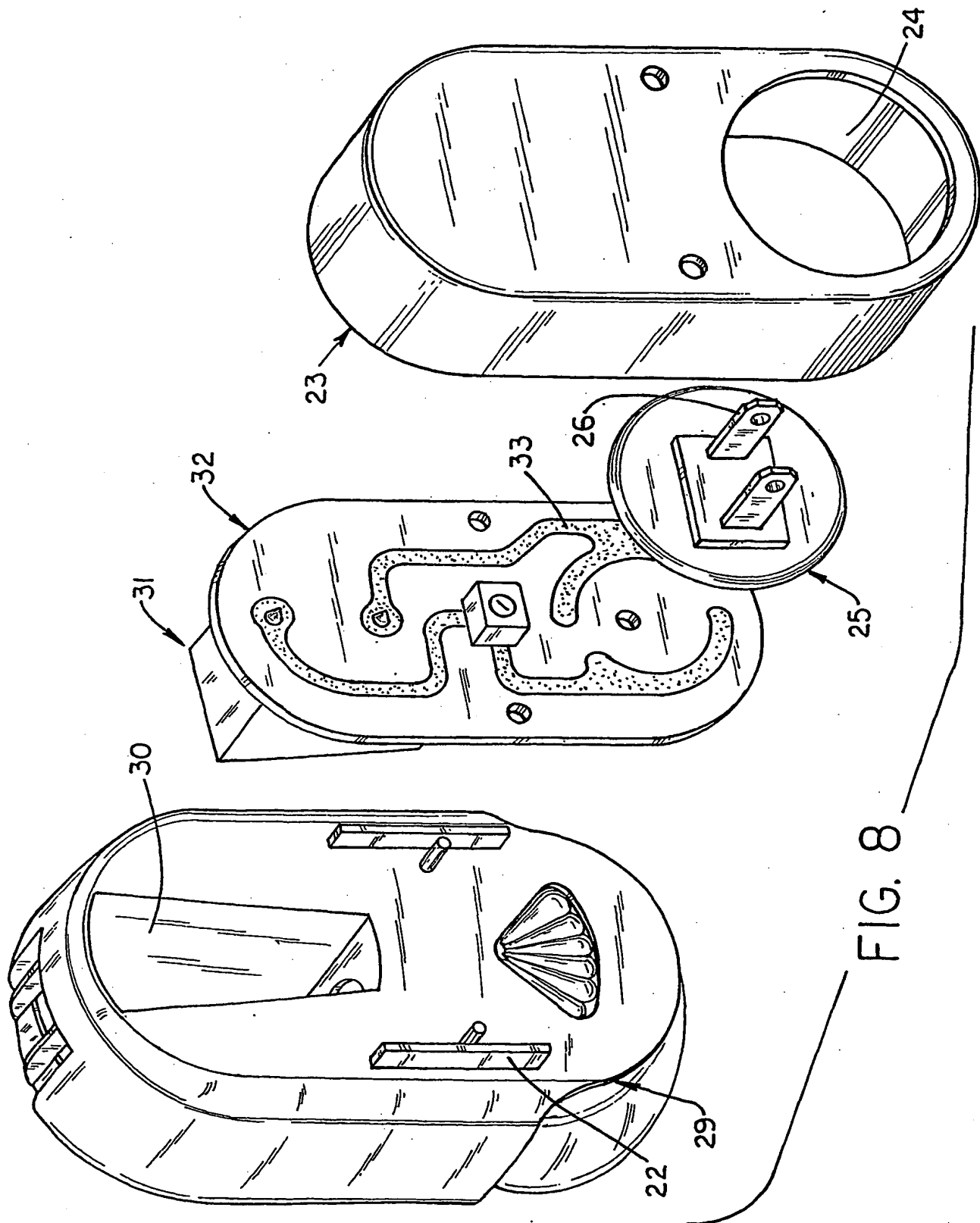
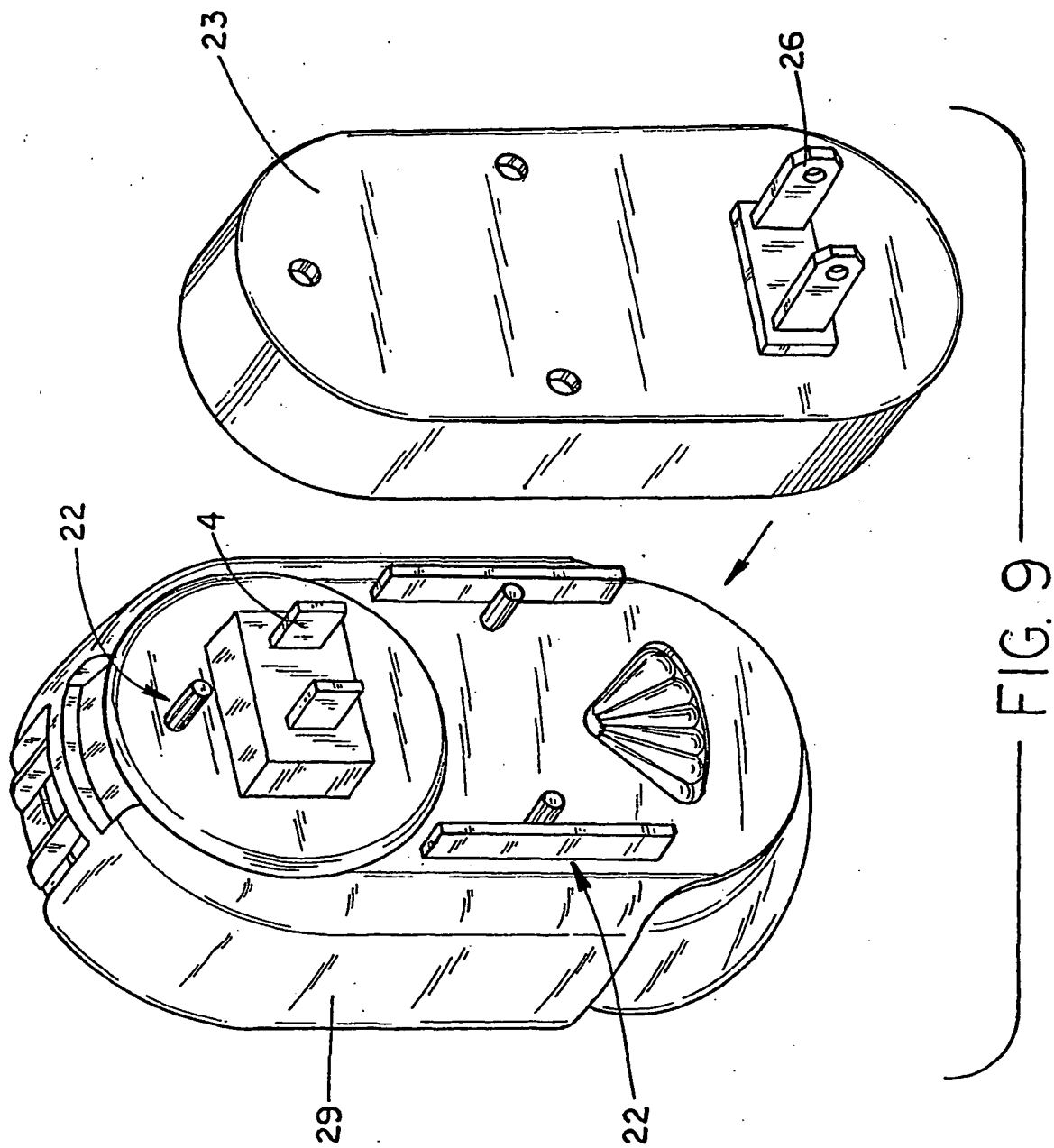


FIG. 8



# INTERNATIONAL SEARCH REPORT

International Application No

PCI/US 01/18633

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 A61L9/03 A01M1/20

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61L A01M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 976 410 A (DEKKO HEATING TECHNOLOGIES INC) 2 February 2000 (2000-02-02) figures	1-14
A	DE 297 14 848 U (BRUGGER GOTTFRIED ;MUELLER WOLFGANG (DE)) 30 October 1997 (1997-10-30) claims; figures	1-14
A	EP 0 945 062 A (ZOBEL IND CHIM) 29 September 1999 (1999-09-29) claims; figures	1-14
A	EP 0 943 344 A (ZOBEL IND CHIM) 22 September 1999 (1999-09-22) claims	1-14
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

12 November 2001

Date of mailing of the international search report

20/11/2001

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International Application No

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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